principia
MISSION

Welcome to the Principia Activity Day at the University of York

Workshops

Countdown to Launch!

Time(s): 10.30, 11.30 and 12.30
Recommended age: 7-14 year olds
Location: P/L/006
Use chemistry to launch a capsule, but can you time take-off to perfection?

Robots

Time(s): 10.30, 11.30, 13.30 and 14.30
Recommended age: 7-14 year olds
Learn to programme your own robot and have fun racing around the track!

Cloud Chambers

Time(s): 10.30, 11.30, 13.30 and 14.30
Recommended age: 12+
Location: Room 003, Ground Floor, Spring Lane Building
Cosmic rays are coming from space all the time. However, we cannot see them or even feel them as they pass through us. In this workshop you will build a detector to see some of these particles.

Microbit

Time(s): 10.30, 11.30, 12.30 and 14.30
Recommended age: 10-16 year olds
Location: Room 004, Ground Floor, Spring Lane Building
Get creative, get connected, get coding!
Do you have the reflexes, or the eyesight, of an astronaut? Find out with BBC micro:bit. Easy-to-program and full of useful sensors, it's a great tool for science and lots of fun.

Tim Pix: Primary

Time(s): 10.30 and 13.30
Recommended age: 7-11 year olds
Location: Room 005, Ground Floor, Spring Lane Building
With the TimPix project students can access NASA International Space Station data on the radiation environment for astronauts. Join us at the Institute for Research in Schools to be a research scientist using data from space and from the Large Hadron Collider. Monitor radiation right here using detectors from CERN.

Astro Pi

Times: 10:30, 12:30, and 14:30
Recommended age: 11+
Location: Room 106, First Floor, Spring Lane Building
Two weeks after Tim Peake blasted off to the International Space Station, a number of augmented Raspberry Pi computers, or "Astro Pis", were also flown to the ISS. Using the board's sensors, Tim ran experiments in space that were created and coded by UK school students. Learn how to do simple coding with the Astro Pi computers. Find out more how your code could be running aboard the ISS.

Sirius Astronomy

Times: 10:30, 12:30, and 14:30
Recommended age: All
Location: Room 107, First Floor, Spring Lane Building
How do rockets work? How do spacesuits keep you alive? How does the Soyuz capsule return you safely to earth? Find out the answers to these questions and more through demonstrations

Tim Pix: Secondary

Time(s): 11.30 and 14.30
Recommended age: 12+
Location: Room 005, Ground Floor, Spring Lane Building

With the TimPix project students can access NASA International Space Station data on the radiation environment for astronauts. Join us at the Institute for Research in Schools to be a research scientist using data from space and from the Large Hadron Collider. Monitor radiation right here using detectors from CERN.

Planetarium Shows

Time(s): Every 30 minutes, 10am – 4pm
Recommended age: All
Location: Exhibition Centre

Join British ESA Astronaut Tim Peake on his journey to the International Space Station. Enjoy a guided tour of the ISS and marvel with him at the scale and wonders of our Solar System.

Earth Observation Detective

Time(s): 10.30, 11.30, 12.30 and 14.30
Location: Spring Lane building
Location: Room 006 Ground Floor, Spring Lane Building

Recommended age: 5-11 year olds

Astronauts and satellites have been producing images of the Earth for over 50 years. Some things are easy to recognise, others look surprisingly different from space. How good are you at working out what they show? Can you tell which were taken by a human and which by a machine?

Sundome

Time(s): Every 30 minutes, 10am – 4pm
Location: Exhibition Centre, Physics
Recommended age: 8+

Join scientists on an exploration of the power of the Sun and fusion energy. Can we make mini suns here on Earth and will these eventually power our power stations?

Mission X: Train like an Astronaut

Time(s): 10.30, 11.30, 12.30 and 14.30
Location: Room 007, Ground Floor, Spring Lane Building
Recommended age: 5-11 year olds

Find out about the challenges of keeping fit and healthy in space. Find out more about how living and working in space affects your body. Have a go at some fun activities such as Get on Your Space Bike, Jump for the Moon, Hydration Station, Smart Materials, and Living Bones...and even check out a real astronaut suit.

Astrocampus tours

Time(s): 10.30, 11.30, 12.30, 13.30, 14.30
Recommended age: All
Location: start from the Exhibition Centre

Bring the mysteries of space closer to home with a guided tour of the planets in our Solar System and a visit the University of York Observatory, Astrocampus. Discover how we observe the night skies and have the opportunity to view the Sun through our telescopes (weather permitting).

Astro Academy: Principia

Times: 10:30, 11:30, 13:30, and 14:30
Recommended age: 11+
Location: Room 102, First Floor, Spring Lane Building

Learn how the National Space Academy designed, constructed, flight-qualified and developed experimental procedures for a suite of physics and chemistry demonstration experiments that were conducted by ESA astronaut Tim Peake aboard the International Space Station (ISS) during his six -month mission in 2016. You'll get to see the resulting videos and learn how these can be used to engage and educate people of all ages on different aspects of physics and chemistry.

Talks

Careers in the Space Industry: Jeremy Curtis (UK Space Agency)
Time(s): 10:30
Recommended age: 11+
Location: Theatre PL001, Exhibition Centre
Becoming an astronaut is rare but several thousand roles support each and every astronaut flight. Engineers who build the ISS modules; physicists and software specialists who've designed the control systems; medical specialists who ensure that Tim's at the peak of fitness; materials scientists who are designing products for use in space; meteorologists who determine whether the weather conditions will be optimal for launch and landing – the list goes on and on. Hear more about how you could get a career in the space

Our Dynamic Sun: Dr Helen Mason (University of Cambridge)
Time(s): 10.30
Recommended age: 14+
Location: Theatre PX001, Exhibition Centre
Several solar spacecraft have been observing the Sun over the past few years: SoHO, Stereo, Hinode and SDO. We now have detailed images and movies of the Sun, which show that it is very complex and dynamic. This talk will review what we have learnt about our Sun from these space observations, in particular what we know about solar activity and solar flares, together with the impact that the Sun can have on the Earth's environment (space weather). Tim Peake witnessed the Sun's activity first hand, when he saw many beautiful aurorae from the ISS.

Space science and exoplanets: Caroline Harper (UK Space Agency)
Time(s): 11:30
Recommended age: 14+
Location: Theatre, Spring Lane Building
Space science and exoplanets: an exciting new mission to search for planets like Earth orbiting other stars, and to assess their potential for hosting life.

One Giant Read: Gareth Powell
Time(s): 11.30 and 13.30
Recommended age: 8+
Location: Theatre PL001, Exhibition Centre
Find out about the ways in which science fiction has influenced science fact with author Gareth Powell. Learn how to begin writing science fiction and hear readings of Science Fiction stories.

Gareth Powell is an award-winning writer from the UK. He is the author of the novels Silversands, The Recollection, Ack-Ack Macaque, Hive Monkey and Macaque Attack, and the short fiction collection The Last Reef.

Tim Peake: Mission Highlights: Libby Jackson (UK Space Agency)
Time(s): 12:30 and 14:30
Recommended age: All
Location: Theatre, Spring Lane Building
Libby Jackson, from the UK Space Agency, takes a look back through the highlights of Tim Peake's six month mission to the International Space Station.

How nuclear physics shaped the Universe: Dr Charles Barton (University of York)

Time(s): 12.30
Recommended age: 14+
Location: Theatre PL001, Exhibition Centre

Journey into the heart of matter and you will discover nature dominated by the nuclear force in the form of the atomic nucleus. The atomic nucleus has been explored for about 100 years but aspects of the nuclear force have influenced the Universe since the Big Bang. By determining the elements created at the Big Bang, regulating the formation of Carbon in the Universe, governing the life and death of stars and determining element synthesis and energy generation in stars, how nuclear physics has tuned our Universe will be showcased

The Problem with Planets: Dr Emily Brunsden (University of York)

Time(s): 13.30
Recommended age: 14+
Location: Theatre PX001, Exhibition Centre Centre

It seems like we are discovering new planets around other stars in the galaxy almost every day. So why are they still such an enigma? Dr Emily Brunsden will be looking at our current best methods of finding planets, their flaws and why some of the most promising planets we have found may not be so much like Earth as we had once hoped. We will also look to the future and how we may really find another habitable planet.

Newton and Universal Gravitation – the story of the apple: Dr. Richard Keesing (University of York)

Time(s): 14.30
Recommended age: 14+
Location: Theatre PL001, Exhibition Centre

This is the story of the apple that Isaac Newton saw fall in the late summer of 1665, which started his speculations about the nature of gravitation and is now seen on Tim Peake's mission patch. An investigation that has involved, amongst other things, dendro-chronology, radio-carbon dating and genetic fingerprinting suggests that the very tree from which the apple fell is still growing today at Woolsthorpe Manor, Newton's birthplace in rural Lincolnshire. A cutting of the tree now thrives at the University of York, and the seeds from the original tree event made it to Tim in space!

Exhibition

Exhibition Centre
Open from 10am – 4pm.

UK Space Agency Chat to the experts and find out about the UK's current space missions

Science and Plants for Schools (SAPS) Fresh plants will provide important vitamins for space travellers in future. In this drop-in activity, test the vitamin C content of different salad leaves.

Royal Horticultural Society Pack your bags, we're off to Mars! Draw or build your own model Martian habitats, while learning how useful bacteria will be in the process of colonising other planets.

Amateur Radio on the International Space Station (ARISS) Find out how Tim could chat with the Earth from the ISS with ARISS. And why not get that sought after photograph with Tim using green screen technology (as used for TV and films).

Great British Space Dinner - the Fat Duck Discover how food was developed for Tim Peake from the winning competition entries from children.

European Space Education Resource Office (ESERO-UK) Find out what children all over the country have been doing to celebrate Tim's mission.

UK Students for the Exploration and Development of Space (UKSEDS) Enjoy a virtual reality tour of the International Space Station; experiment with a meteorite investigation kit; and make cardboard star wheels that you can take home. Plus get to see some rockets which have previously flown and videos of some of our rocket launches and our High Altitude Balloon flights.

Into Film Find out about 3D digital modelling and you may get the chance to create your own spaceship or Tim Peake inspired moment in the ISS, or come and join us to experience a virtual reality headset and hear about jobs in the video game industry.

UK Centre for Astrobiology (University of Ediburgh) Outer space is the most extreme environment for microorganisms. Find out how astrobiologists are studying the response of microorganisms to the space environment using the International Space Station and their new space experiment, BioRock. Is there potential for life beyond Earth? Could we use of microorganisms in space exploration?

Destination Space Pop along to our stand to try out some investigations, get up close to a replica Sokul space-suit, and find out your role in Tim's Space Crew.

Seeing the Invisible (University of York) Find out how rainbows can help to tell us what stars are made of and investigate the whole range of light – including light you can't see! Make bracelets, design fluorescent art work, find out who's the coolest person in the room – literally, and discover how some of the biggest telescopes in the world work.

Binding Blocks (University of York) Join us to find out about nuclear physics...using Lego! Help to build a giant chart and speak to researchers to discover what this tells us about how stars are made.

Triathlon Sporting activities Take our Space2Earth DryTri challenge of 500m on a static bike followed by 10 'space-jumps'. Watch out for that 'jelly-leg' feeling when you get off the bike!

AstroScience Challenge Come and visit the Unlimited Space Agency in their Space Shed and HQ. Throughout the day, you can learn about Newton's Law of Gravity by building and launching your own rockets!
European Space Education Resource Office (ESERO-UK): Find out what children all over the country have been doing to celebrate Tim's mission.

Royal Society of Great Britain (RSGB) Try fun interactive exhibits about wireless; find the hidden transmitter; try your hand at sending morse code; have a go at our quiz; and see how radio stations can be plucked out the air.

Sustainability and Space (University of York) Discover how advances in space-related technology can influence sustainable living on Earth, or perhaps on other planets?

Shows

Team Tim
Time(s): 10.30 and 13.30
Recommended age: 4-11
Location: Theatre, Spring Lane Building
This interactive science show invites family audiences to help British ESA Astronaut Tim Peake complete his daily space schedule! Help Tim to keep fit, do quick calculations, conduct science experiments, grow space plants, launch small satellites, and perform a thrilling spacewalk to fix an ageing electrical circuit!

Destination Space
Time(s): 11.30 and 14.30
Recommended age: 5-14
Location: Theatre PX001, Exhibition Centre
With live experiments and explosions, the Destination Space show takes a closer look at how we get into space, what life is like on board the ISS and how astronauts return to Earth.